

**OLIFF & BERRIDGE, PLC**

ATTORNEYS AT LAW

277 SOUTH WASHINGTON STREET, SUITE 500  
ALEXANDRIA, VIRGINIA 22314

TELEPHONE: (703) 836-6400

FACSIMILE: (703) 836-2787

E-MAIL: COMMCENTER@OLIFF.COM  
WWW.OLIFF.COM*kerr effect,  
will note***FACSIMILE TRANSMISSION COVER SHEET**

May 3, 2002

To: United States Patent and Trademark Office  
Attention Examiner Chu

703-746-6909

From: Richard S. Elias

Your Ref.: 09/181,809

Our Ref.: 101327

Number of Pages Sent (Including cover sheet): 9

Prepared By: kap

**Comments:**

Examiner Chu-

Further to our April 30 telephone conference, please find attached a proposed copy of the Appendix discussed. If I can be of further assistance, please contact me.

Rick Elias

Sent by:

This facsimile is intended only for the use of the individual or entity named above and may contain privileged or confidential information. If you are not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are notified that any review, dissemination, distribution or copying of this facsimile is prohibited. If you have received this facsimile in error, please immediately notify us by facsimile or telephone, and return the facsimile to us by mail at the above address.

*6228440  
5654046  
8516568**8044651 - liquid crystal  
layer,**note light in a certain  
angle is obvious  
e.g. LCD watch display.*

Docket No. 101327

Application No. 09/181,809

## APPENDIX A

**PROPOSED**

## Changes to Claims:

The following is a marked-up version of the amended claims:

1. (~~Three~~Four Times-Amended) An optical recording medium, comprising at least one optical recording layer, the optical recording layer including an optical recording material having at least one of a polymer or a liquid crystal polymer that changes a state of photo-induced birefringence in response to a recording light that is externally controlled from the optical recording medium to rotate a polarization angle of the recording light, a portion of the recording layer that changes a state of photo-induced birefringence substantially acting optically as a half-wave plate; and

a substrate which sustains the optical recording layer,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of a reproducing light is at least twice that of the recording light.

11. (~~Twice~~Three Times-Amended) An optical recording medium comprising: at least one optical recording layer including an optical recording material that changes a state of photo-induced birefringence in response to a recording light that is externally controlled from the optical recording medium to rotate a polarization angle of the recording light, a portion of the recording layer that changes a state of photo-induced birefringence substantially acting optically as a quarter-wave plate; and

an optical reflection layer formed on one surface of said optical recording layer,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of a reproducing light is at least twice that of the recording light.

Docket No. 101327

Application No. 09/181,809

21. (~~Three~~Four Times-Amended) An optical recording medium, comprising an optical recording layer that includes a material having at least one of a polymer or a liquid crystal polymer in which an azimuth of birefringence that is induced by a recording light externally controlled from the optical recording medium to rotate a polarization angle of the recording light changes in response to a rotation of the polarization angle of said recording light; and

a substrate which sustains the optical recording layer,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of a reproducing light is at least twice that of the recording light.

22. (~~Twice~~Three Times-Amended) An optical recording method comprising: controlling a polarization angle of a recording light emitted from a light source, the recording light externally controlled from an optical recording medium to rotate the polarization angle of the recording light;

illuminating the optical recording medium with said recording light; and

forming an optical element on the optical recording medium by the illumination, that acts substantially as a half-wave plate, having an azimuth corresponding to a polarization angle on the optical recording medium,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of a reproducing light is at least twice that of the recording light.

26. (~~Twice~~Three Times-Amended) An optical recording method comprising: controlling a polarization angle of a recording light emitted from a light source, the recording light externally controlled from an optical recording medium to rotate the polarization angle of the recording light;

**PROPOSED**

Docket No. 101327

Application No. 09/181,809

illuminating the optical recording medium with said recording light; and  
forming an optical element on the optical recording medium by the  
illumination, that acts substantially as a quarter-wave plate, having an azimuth corresponding  
to a polarization angle on the optical recording medium,

wherein recorded information can be reproduced from the optical recording  
medium so that the polarization angle of a reproducing light is at least twice that of the  
recording light.

35. (~~Three~~Four Times-Amended) An optical recording medium, comprising an  
optical recording layer including an optical recording material having at least one of a  
polymer or a liquid crystal polymer that stores multilevel information using a light induced  
birefringence that acts optically as a half-wave plate, an orientation of an azimuth of  
birefringence formed by a recording light representing the multilevel information, the  
recording light externally controlled from the optical recording medium to rotate a  
polarization angle of the recording light; and

a substrate which sustains the optical recording layer,

wherein recorded information can be reproduced from the optical recording  
medium so that the polarization angle of a reproducing light is at least twice that of the  
recording light.

37. (~~Three~~Four Times-Amended) An optical recording medium, comprising an  
optical recording layer including an optical recording material having at least one of a  
polymer or a liquid crystal polymer that stores multilevel information using a light induced  
birefringence that acts optically as a quarter-wave plate, at orientation of an azimuth of  
birefringence induced by controllably rotating a polarization angle of a recording light  
externally from the optical recording medium that represents the multilevel information; and

a substrate which sustains the optical recording layer,

**PROPOSED**

Docket No. 101327

Application No. 09/181,809

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of a reproducing light is at least twice that of the recording light.

39. (~~Three~~Four Times-Amended) An optical recording medium, comprising an optical recording layer having at least one of a polymer or a liquid crystal polymer in which an azimuth of birefringence induced by controllably rotating a polarization angle of a recording light externally from the optical recording medium is multilevel-modulated and recorded in response to a rotation of a polarization angle of said recording light; and

a substrate which sustains the optical recording layer;

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of a reproducing light is at least twice that of the recording light.

40. (~~Twice~~Three Times-Amended) An optical reproducing method comprising: radiating a reproducing light on an optical recording medium in which an azimuth of an optical element that acts substantially as a half-wave plate is multilevel recorded in response to a polarization angle of a recording light that is externally controlled from the optical recording medium to rotate the polarization angle of the recording light; and

determining a polarization angle of the reproducing light transmitted by said optical element;

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

43. (~~Twice~~Three Times-Amended) An optical reproducing method comprising: radiating reproducing light on an optical recording medium in which an azimuth of an optical element that acts substantially as quarter-wave plate is multilevel-

Docket No. 101327

Application No. 09/181,809

recorded in response to a polarization angle of a recording light that is externally controlled from the optical recording medium to rotate the polarization angle of the recording light; and determining a polarization angle reproducing light reflected from said optical element,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

46. (~~Twice~~Three Times-Amended) An optical reproducing apparatus comprising: a reproducing light optical system for transmitting reproducing light to an optical recording medium in which an azimuth of an optical element that acts substantially as a half-wave plate is multilevel recorded in response to a polarization angle of a recording light that is externally controlled from the optical recording medium to rotate the polarization angle of the recording light; and

an analyzing unit that detects a polarization angle of reproducing light transmitted by said optical element,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

49. (~~Twice~~Three Times-Amended) An optical reproducing apparatus comprising: a reproducing light optical system for emitting reproducing light toward an optical recording medium in which an azimuth of an optical element that acts substantially as a quarter-wave plate is multilevel recorded in response to a polarization angle of a recording light that is externally controlled from the optical recording medium to rotate the polarization angle of the recording light; and

**PROPOSED**

Docket No. 101327

Application No. 09/181,809

an analyzing unit that detects a polarization angle of reproducing light reflected by an optical reflection layer and transmitted by said optical element,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

52. (~~Twice~~Three Times-Amended) An optical recording and reproducing apparatus comprising:

a light source that generates a recording light;

a polarization rotary device that rotates a polarization angle of said recording light;

a focusing optical system that irradiates an optical recording medium with said recording light obtained from said polarization rotary device;

a reproducing light optical system that irradiates said optical recording medium with reproducing light; and

an analyzing unit that detects a polarization angle of reproducing light acted on by said optical recording medium,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

53. (~~Twice~~Three Times-Amended) A method for optically recording and reproducing information, comprising:

controlling a polarization angle of a recording light emitted from a light source, the recording light controlled externally from an optical recording medium to rotate the polarization angle of the recording light;

illuminating the optical recording medium with said recording light;

Docket No. 101327

Application No. 09/181,809

forming an optical element on the optical recording medium by the illumination having an azimuth corresponding to a polarization angle on the optical recording medium;

radiating reproducing light on the optical recording medium; and

determining a polarization angle of reproducing light acted on by said optical element,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

54. (~~Twice~~Three Times-Amended) A device for optically recording and reproducing information, comprising:

controlling means for controlling a polarization angle of a recording light emitted from a light source, the recording light controlled externally from an optical recording medium to rotate the polarization angle of the recording light;

forming means for forming an optical element on the optical recording medium by the illumination having an azimuth corresponding to a polarization angle on the optical recording medium;

illumination means for radiating reproducing light on the optical recording medium; and

determining means for determining a polarization angle of reproducing light acted on by said optical element,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

**PROPOSED**



Docket No. 101327

Application No. 09/181,809

55. (~~Three~~Four Times-Amended) An optical recording medium, comprising an optical recording layer having at least one of a polymer or a liquid crystal polymer in which an optical element is formed by a recording light that is externally controlled from the optical recording medium to rotate a polarization angle of the recording light, the optical element having an azimuth of birefringence and acting on reproducing light to adjust a polarization angle of the reproducing light by an amount greater than a difference between a polarization angle of the recording light used to form the optical element and a polarization angle of the reproducing light before the reproducing light is acted on by the optical element; and

a substrate which sustains the optical recording layer,

wherein recorded information can be reproduced from the optical recording medium so that the polarization angle of the reproducing light is at least twice that of the recording light.

**PROPOSED**